

Propylene carbonate (PC) has generated a high level of interest as an electrolyte solvent due to having greater physical properties when compared to that of traditional ethylene carbonate (EC). Additionally, lithium difluoro(oxalate)borate (LiDFOB) has shown promise as an alternative to lithium hexafluorophosphate (LiPF<sub>6</sub>) as a primary electrolyte salt. Coin cells of 1.2M LiDFOB in 3:7 PC/EMC were constructed using natural graphite/LiCoO<sub>2</sub> electrodes and cycled in order to obtain discharge capacities. *Ex situ* surface analysis of the electrodes was conducted via the use of x-ray photoelectron spectroscopy (XPS), scanning electron microscopy (SEM), and Fourier-transform infrared spectroscopy (FT-IR). The corresponding results for PC and LiDFOB with the addition of 1.5% vinylene carbonate cycled comparably to that of standard 1.2M LiPF<sub>6</sub> in 3:7 EC/EMC showed that LiDFOB is a good alternative salt to use in PC-based electrolytes for lithium-ion batteries.